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II. *Two Letters concerning several Copper Mines, in answer to some Queries proposed by Dr. Lister, S. R. S. who communicated them to the Publisher.*

L E T T E R I.

S I R,

A Ccording to your desire I have given you an Answer to the Questions about the Copper Mines to the best of my knowledge, which are as followeth.

The First Query is, *What quantity of unwrought Copper Ore is left upon the place, and where it is, and in whose hands, and what is the reputed value of a Tun of unwrought Copper Ore ?*

To which I answer, *That there is a heap of Ore by Darwent near Kefwick ; and I suppose no body lays Claim to it, but it is not worth any thing ; for being there so long, the Weather hath eaten out all the Copper that was in it. And for the value of a Tun of Copper Ore unwrought, I know not what it is worth, neither is there any in this Country that can tell ; neither can any Man know, except there were Ore got, that the Goodness or Badness may be seen by the more or less mixture of Stone that is in it, or by other Symptoms of kindly Ore.*

The Second Query is, *What use can be made of the Slaggs of Copper Ore ? and whether they can be washed over again, as is practised in Lead-works ?*

The only Answer that I have to this Question is, That I do not know any thing of it, neither can it be known

in this Country, all the Ancient Men that wrought at the Smelting of it being dead ; but it may be Mr. *Hex-techer's* Book will give some Account of it. That Book is in Mr. *Anglionby's* Custody at *Carlisle*.

The third Question is, *What Thickneß and Goodneß the Vein of Copper Ore is reputed to be of ?*

In Answer to which I say, It is reported that the *thickneß of the Vein at Gouldscope in Newlands was six Foot* ; but for the goodneß it cannot be known without comparifon of divers forts, to fee which is beft ; and no Comparifon can be made in things unfeen.

The fourth Question is, *What number of Shafts and Addits are at the Work ? and what the great Addit cost ? and when was it finished ? and if it be yet finished ? if not, what will it cost to clear and perfect it ?*

To which I answer, That I have divers times viewed and well confidered both of *Caldbeck* and *Newlands* Mines, and know that there is no Shafts in-being neither at *Caldbeck* or *Newlands* ; and if there hath been any, they are filed up, and will be of no ufe for any that fets the Work on again, by reason that the Copper is wrought away from under them. There are divers Addits finished, which will be of no ufe, being that they will not clear the Work of Water : For the old Workmen have wrought down the Ore far below the Addits by the benefit of Water Engines and Pumps ; fo that there can be no good done without new Addits. There is part of an Addit wrought at *Caldbeck*, but how much it wants to be finished I know not, neither can I tell what it will cost the finishing : For the Stone may be harder or fofter ; for some Stone may be wrought for 20 s. *per* Fathom, and some of it may prove fo hard,
that

that it may cost 10 *l.* per Fathom, besides many Inconveniences which now lie hid, will in the working of it appear, as the sinking of Air-Shafts, or other Engines for that use.

The fifth Query is, *What quantity of Copper Ore was usually landed out of Caldbeck Mines in a Year, and what quantity of Lead in the same place? and whether more Copper might not be wrought out of the same Mine alone, if more Hands and a greater Fund had been provided ready to defray the Charges?*

To the first part of this Question I cannot answer, but shall refer you to *Hextecher's Accompts*, which will give you some light in it. And to the latter part of the Query I answer thus, That no doubt a greater quantity of Copper might be got out of the same Mines, if more Hands and a greater Stock were provided.

The sixth Query is, *What Men are yet alive about Kefwich, or elsewhere, in the County of Cumberland, that have actually wrought in the Copper Mines; and what Ability of Body to work again, or to direct other Miners in the same Mine.*

To which I answer, That I have made Enquiry, and cannot hear of any that is alive that did actually work in those Mines; and if there be any, they are so old, that they are not capable to direct others.

The seventh Query is, *Whether 1000 *l.* Stock or Fund will sufficiently set on foot the Caldbeck Mines, and bring the rest in some years to perfection?*

To which I answer, That 1000 *l.* Stock will be enough to begin with to get Ore; and when there is Ore gotten, there must be Smelting-Houses built, which will cost 500 *l.* or more, if they are well built; so that

it will take up a long time before the Work be brought to Perfection. That is to say, before Copper be made ready for sale at the Market, it will be 6 or 7 years at least, and by that time 10000 *l.* will be Stock little enough: Though it will be laid out gradually, yet in that time before the Work come to pay it self, it will require the afore-mentioned Stock.

And this is the best Answer that I can make to the Queries; but *there are Questions of greater Importance than those, which ought to be well answered before the Copper Mines be set on work.*

What I have referred you to Mr. *Hextecher's* Book is not because I admire his way of Working the Mines, especially towards the latter part of the management of it; for I know the Ill Management was the destruction of it in the working of the Mines only: For I know that the Mines might have been wrought with one third of that Money to better purpose, as I can sufficiently demonstrate, if required: But for the Smelting Part I am ignorant of it. Nothing else, but due Respects from your humble Servant.

Brathwaite, Jun. 28.
1684.

David Davies.

LET-

L E T E R II.

An Account of the Names of the several Copper-works, or Mines, in Coniston-fells, which were wrought in, when the Smelt-Houses were up at Keswick; and of those places discovered since, which were never wrought in; taken from three old Men hereafter named, who were Workmen in the said Works, and are all of those Workmen who are now living in this County of Lancaster.

THE first Work that was found and wrought in by the *Dutch-men* in *Coniston-fells*, is called *Low-work*. It hath a Stulm or Shaft to draw Water from the Mine. When the Smelt-Houses were up at *Keswick*, and when they left off working, this Work was left good, and had been wrought from the Day to the Evening-end of the said Work Forty Fathoms, or thereabouts; the Seam or Vein of Copper-Ore then was left above three quarters of a yard thick of good Ore, which Seam or Vein did go from the Evening-end to the Morning-end of the said Work, and was esteemed two hundred Fathoms betwixt, wrought as the Vein went; and was, when left, all near of a Breadth or Thickness. The Copper Ore in this Work was mixt with some Silver, or Lead-Ore. The three Workmen hereafter named do judge, that about Two Hundred Pounds will recover this great Work.

The Second Work is called *White-work* or *New-work*, about Forty Fathom from the first; which was found a little before the Works were given over, being wrought
about

about Ten Fathom deep ; the Seam then left was about 22 Inches of good Copper Ore, and may be recovered by these Men for Forty Shillings.

The Third Work is called *Young Brow*, a little distant from the last, being wrought about Thirty Fathom, and the Seam about two Foot thick of like Ore ; and may be recovered with Three Pounds.

The Fourth Work is called, *God's Blessing*, or *Thurdle-Head*, being wrought about Twenty Fathom, and being from the last Mine about a Mile ; the thickness of the Seam of Ore above a Yard when left off ; and thought by these Work-men much of it to be Gold-Ore, it having been highly prized by their Masters at *Keswick*, and may be recovered with about Three Pounds.

The Fifth Work is called *Hen-Cragg*, a Mile from the last, wrought about two Fathoms ; a small Seam, but excellent Ore, and hopeful to prove a large Seam. A small thing may recover it.

The Sixth Work is called *Sumy-work* at *Lavers Water*, at the Water-side, and a little above that *Hanch Clockers-work*, a little above that *George Towers* and *William Dixon's Work*, *Bartle Clocker's Work*, near the last *Richard Towers's Work*, then *John Sackloc's Work* and *Hanch Mire's Work*, being all Seven Works, and lie all together, and about a Mile from the Fifth Work above said, and wrought about 10 or 12 Fathom, the Seam of Ore about 16 Inches thick, the Stone very soft, and the Ore very rich, and much of the said Ore green, and was very much prized by the Head Masters at *Keswick*. All these Seven Works may be recovered with about 20*l*. the Seams of them all being near alike in thickness.

A little before the Smelt Houses left working at *Keswick*, Mr. *Hecstetter* had intended to have drawn a Shaft or Sump, to have drained a Tarn which all the Seven Works do shut into. He then, if the Works had continued,

tinued, could have had it done for about Sixty Pounds. It was thought then by the Workmen, that if the Tarn had been drained, that all these Seven Works would come into one, and that it would be the best Work that ever was in these parts.

The Seventh Work is called *Gray-Cragg beck*, found by *William Dixon*, wrought but a little, the Seam about Eighteen Inches thick, of as good Ore as any of the other Works, and very hopeful to have a good Seam. A little will recover it.

The Eighth Work is called *John Dixon's Work* in *Brumfell* then newly found, and wrought about two Fathom, the Seam about 24 Inches thick, and esteemed the best Ore, except *God's Blessing*. A small thing will recover it, it being half a Mile from the last Work.

The Ninth Work is called the *Wide Work*, or *Thomas Hinn's Work*, wrought about Three-score Fathom, and left a Seam above 26 Inches thick when the Work was given over, of very good Ore, and may be recovered with about 30 *l*. It has a Shaft or Sump to draw the Water away, and it is from the last Work about Two Miles.

The Tenth Work is called *Three Kings* in *Tilburthwait*, being 3 Works, and wrought above Forty Fathoms apiece, the Seam being above 14 Inches of very good Ore, but a little troubled with Water, having no Sump to draw it away. There is Fall enough to make one, and is near the last Work, and may be recovered with about 40 *l*. These are all the Works that have been wrought in *Coniston-fells*. Most of the Works here mentioned have small Seams near the Copper, of a Grey sort of Ore in small Threds.

The *New Places* discovered lately, and never wrought in, and several found this Year, Three in *Torverwel*, and about Ten in other places, and all near within

two Miles of the first Work in *Coniston-fell*, and as hopeful as those that have been wrought in.

These three Work-men do acquaint me, that the Works in *Coniston-fells* were found a long while after the Works at *Newlands* and *Caudbeck*. When the Ore which was gotten at *Coniston* came to be smelted at *Keswick*, they found it so much to exceed the Copper Ore of either *Caudbeck* or *Newlands*, that they let fall the Works of both those places, and sent the Workmen from thence to *Coniston-fells*, and little or none of the other Ore was made use of: So that there was above Seventy Work-men kept constantly at the Works in *Coniston-fells*. The Ore which they got there did sufficiently furnish and supply the Smelt-houses at *Keswick*.

They do further acquaint me, That they have heard Mr. *Jos. Heckstetter* say several times, That if ever he should be employed as the Head of the Works at *Keswick*, he would have caused new Smelt Houses to have been set up at *Coniston*, near to where the Ore was got, which would have saved a great deal in Carriage, it being above Twenty Miles from *Keswick*, and none of the way Cartable, and that both Wood and Peates are near, and very plentiful at *Coniston*, and Stone Coals cheap enough by Sea to help to smelt the Ore with; *Penny-Bridge*, our next Sea-Port, being Seven Miles off, two of which Miles are by Land, and Cartible, and the rest by Water up *Coniston Meere*.

The Rate that was given for getting of Copper-Ore was according to its Goodness, from 8 s. a Kibble to 2 s. 6 d. every Kibble being near a Horse-Load in weight, it being first beaten very small, washed and sifted thro' an Iron Sieve, then measured or weighed.

*An Answer to the Seven Enquiries, as to
Coniston.*

To the First : No Copper Ore is already got in *Coniston*.

To the Second : All Copper Ore is knocked, washed and sifted ; the finest at one Rate, and courser at another, having a Rate according to the richness of the Ore.

There was near the first Work a *Stamp house*, which went by Water, and several persons were employed to bring the Refuse from each Work, that the Miners did throw away, to the Stamp-house, where it was stamped, washed and ordered, and they had 2 s. 6 d. a Kibble for their pains.

To the Third and Fourth Question: which are answered in the Description of the several Works aforesaid.

To the Fifth : Here is Copper Ore enough to be got with Men and Money.

To the Sixth : Here are only left alive 3 Workmen ; the Names of them are, *George Towers*, *William Towers*, and *Henry Dover* ; all able yet to work, and they all live in *Coniston*.

To the Seventh : A Thousand Pound will get a great quantity of Ore ; but what the Charge will be in making the Smelt-houses, they cannot judge, but believe they may be made here at *Coniston* far cheaper than in any other place in the North, by reason of the great Cheapness and Plenty of Wood, Stone, and Ground to build on, there being Water sufficient to supply any such great Work ; and there being now an *Iron Forge* upon the said Water, not half a Mile from the first Work. This is as exact an Account of these Mines as can be got.

Coniston April, 13.

1684.

Tours, &c.

D d

III. Ed-